CYCLONE Xi™

UP TO 96% THERMAL EFFICIENCY,DIRECT VENT

BTH-120 through BTH-500

The A.O. Smith Cyclone Xi family of products represents the industry's most technologically advanced commercial water heaters. The innovative Cyclone Xi design takes performance to its highest level with efficiencies of 95% and 96%. Models are available from 120,000 BTUs and now up to 500,000 BTUs. In addition, the Cyclone Xi features an Intelligent Control System making it the smartest water heater in the industry.

Cyclone Xi provides outstanding hot water output, with dramatic savings on operating costs compared to units with standard 80% efficiency. A.O. Smith's leading-edge engineering delivers conventional power-vent or sealed combustion power direct-vent versatility, low NOx emissions and excellent space-saving characteristics. Powered anodes, standard on all Cyclone Xi models, provide superior tank protection for years of trouble free operation.

SCAQMD Approved, Rule 1146.2 Low NOx for California and Texas

INTELLIGENT CONTROL SYSTEM WITH LCD DISPLAY

- Exclusive A.O. Smith designed control
- Provides detailed water heater status information
- Precise temperature control
- Built-in diagnostics
- Run histrory information

SUBMERGED COMBUSTION CHAMBER, WITH HELICAL HEAT EXCHANGER COIL

- Positioned in center of tank, surrounded by water to virtually eliminate radiant heat loss from chamber
- Spiral heat exchanger keeps hot burner gases swirling, uses centrifugal force to maximize efficiency of heat transfer to water in tank
- Spiral heat exchanger prevents scale and sediment from forming on water-side surface, which can reduce energy efficiency over time

POWERED ANODES STANDARD ON ALL MODELS

- Provides long-lasting tank protection in varying water conditions
- Does not require maintenance or inspection

PERMAGLAS® ULTRA COAT™ GLASS LINING

- Exclusive process provides superior protection against corrosion
- Both sides of heat exchanger coil are lined for protection against flue gas condensate inside coil

MECHANICAL VENTING VERSATILITY

- Conventional power-venting or sealed combustion direct venting
- Vents vertically or through sidewall
- Direct-vent intake and exhaust pipe can terminate separately outside building, or through single opening, using concentric vent assembly
- Uses inexpensive PVC, CPVC or ABS pipe for intake and exhaust

HIGH EFFICIENCY PRE-MIX POWERED BURNER

- Down-fired pre-mix burner provides optimum efficiency and quiet operation
- Top-mounted burner position prevents condensation from affecting burner operation

BTH-120-250

ASME (OPTIONAL)

BTH-300-500

ASME

ACGSS02407

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OTHER CYCLONE Xi FEATURES

SPACE-SAVING DESIGN FOR INSTALLATION FLEXIBILITY

- Reduced footprint, ease of service, protection from water damage in case of flooding
- Easy to remove top cover for convenient access to serviceable parts
- 0″ installation clearances on sides and rear, 2″ installation clearance on top, 4″ alcove installation clearance in front of unit
- 0″ clearance to combustibles, approved for combustible floors

FACTORY-INSTALLED TEMPERATURE AND PRESSURE RELIEF VALVE

MAXIMUM HYDROSTATIC WORKING PRESSURE: 160 PSI

HANDHOLE CLEANOUT

- Allows easy access to tank interior for cleaning

CODES AND STANDARDS

- Design-certified by UL (Underwriters Laboratories) International, according to ANSZ21.10.3-CSA4.3 standards governing storage-type water heaters
- Meets ASHRAE/IESNA 90.1-1999• Design-certified by Underwriters Laboratories to NSF standard 5 for 180° F (62° C) water
- Meets SCAQMD Rule 1146.2 for low-NOx emissions
- ASME tank construction optional on 120 to 250 model sizes. ASME tank construction standard on 300,400 and 500 models

THREE-YEAR LIMITED TANK WARRANTY

- For complete warranty details, consult written warranty shipped with heater, or contact A. O. Smith

INSTALLATION CONSIDERATIONS

1. Condensate Drain – This is a fully condensing water heater and should be located near a drain to permit proper disposal of condensate.

2. Vent Termination – Exhaust gases of this water heater are less than 140° F. In cold climates water vapor in flue gases will condense into a cloud of vapor where the vent exits the building. This vapor can gradually discolor exterior building surfaces. Vent termination should be located where this vapor cloud and potential discoloration are not a concern. Locating vent termination 6″ or more from the wall helps vapor from being trapped along a building's face. To avoid this problem, the vent can be terminated on the roof. Always locate vent termination above the maximum snowline, and do not locate vent termination above a walkway.

3 Air Intake – In cold climates, air intake should be located at least three feet from the vent termination of the water heater and any other appliance vents that discharge moisture-laden air (such as clothes dryers). This will help prevent freeze-over of the intake screen required to prevent foreign objects from entering the intake pipe. Air intake should be located above the maximum snowline.

4. Blockage Sensors – The water heater is equipped with sensors to shut it down if blockage of vent or air intake occurs. A light on the heater's diagnostic panel will alert service technicians to this problem.

5. Noise – Vent terminal should be located away from bedroom windows or other areas where blower noise will be objectionable. Avoid venting into corners or confined areas, which will amplify sound. Anchoring intake or vent pipe to walls or ceilings can cause noise to be transmitted to living areas, and isolation mounts should be used where anchoring is required.

6 Optional Concentric Vent Kit - Helps to minimize unsightly wall/roof penetrations.
BTH-120 - 300 vent kit p/n 9003910105
BTH-400 - 500 vent kit p/n 9006144005

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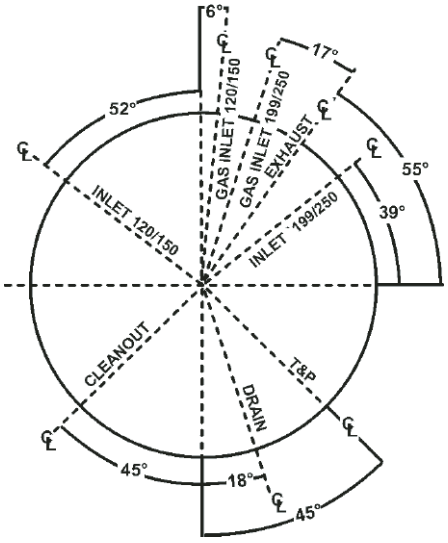
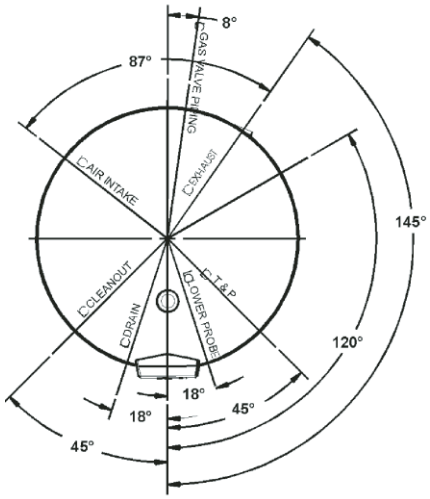
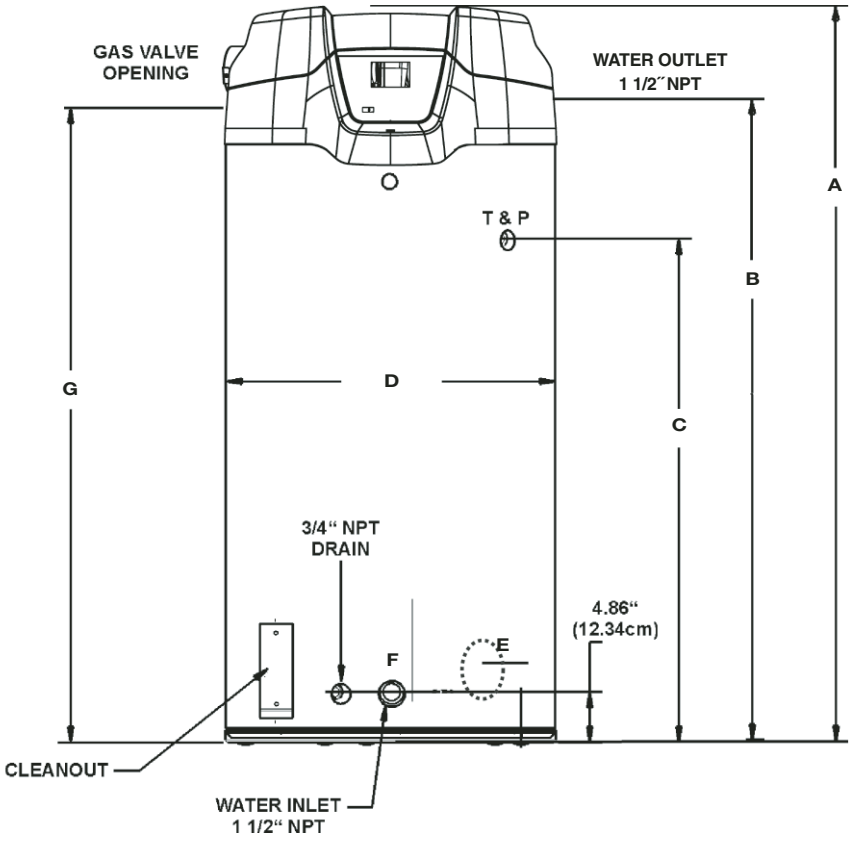
BTH-120-250



BTH-300-500





INSTALLATION CLEARANCES

Sides	0″
Front	0″
Rear	0″
Top	1.5″
To Combustibles*	0″

• Approved for combustible floors

GAS VALVE PIPING	
BTH-120	1/2″ NPT
BTH-150	3/4″ NPT
BTH-199	3/4″ NPT
BTH-250	3/4″ NPT
BTH-300	1 1/4″ NPT
BTH-400	1 1/4″ NPT
BTH-500	1 1/2″ NPT

MAXIMUM EQUIVALENT VENT LENGTH:	
BTH-120 – 250	using 3″ pipe: 50 ft.
BTH-120 – 250	using 4″ pipe: 120 ft.
BTH-300 – 500	using 3″ pipe: not applicable
BTH-300 – 500	using 4″ pipe: 70 ft.

DIMENSIONS AND SHIPPING WEIGHTS

MODEL	DIMENSIONS							SHIP WEIGHT STD	SHIP WEIGHT ASME
	A	B	C	D	E	F	G		
	INCHES/CM	INCHES/CM	INCHES/CM	INCHES/CM	INCHES/CM	INCHES/CM	INCHES/CM	LBS/KG	LBS/KG
BTH-120	55.5/141	44.5/113	35/88.9	27.75/70.5	7.5/19.1	6.3/16	47/119.4	460Lbs/208.7Kg	490Lbs/222.2Kg
BTH-150	75.5/191.8	64.5/163.8	55.5/141	27.75/70.5	7.5/19.1	6.3/16	68/172.7	555Lbs/251.7Kg	595Lbs/269.9Kg
BTH-199, 250	75.5/191.8	64.5/163.8	55.5/141	27.75/70.5	7.5/19.1	6.3/16	72/182.9	555Lbs/251.7Kg	595Lbs/269.9Kg
BTH-300, 400, 500	75.5/191.8	64.5/163.8	50.77/129	33.12/84.1	8/20.3	4.86/12.3	67.25/170.8	N/A	855Lbs/408.2 Kg

Water connections: 1-1/2″

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RECOVERY CAPACITY

MODEL	TYPE OF GAS	INPUT BTUH	INPUT KW	Thermal Efficiency	Approx. Capacity		U.S. Gallons/Hr and Litres/Hr at TEMPERATURE RISE INDICATED											
						Fº	30 Fº	40 Fº	50 Fº	60 Fº	70 Fº	80 Fº	90 Fº	100 Fº	110 Fº	120 Fº	130 Fº	140 Fº
						Cº	17 Cº	22 Cº	28 Cº	33 Cº	39 Cº	44 Cº	50 Cº	56 Cº	61 Cº	67 Cº	72 Cº	78 Cº
BTH 120	NATURAL/ PROPANE	120,000	35	95%	60 U.S. Gal	GPH	461	345	276	230	197	173	154	138	126	115	106	99
					227 Litres	LPH	1744	1308	1046	872	747	654	581	523	476	436	402	374
BTH 150	NATURAL/ PROPANE	150,000	44	95%	100 U.S. Gals.	GPH	576	432	345	288	247	216	192	173	157	144	133	123
					379 Litres	LPH	2179	1635	1308	1090	934	817	726	654	594	545	503	467
BTH 199	NATURAL/ PROPANE	199,900	58	95%	100 U.S. Gals.	GPH	767	575	460	384	329	288	256	230	209	192	177	164
					379 Litres	LPH	2904	2178	1743	1452	1245	1089	968	871	792	726	670	622
BTH 250	NATURAL/ PROPANE	250,000	73	95%	100 U.S. Gals.	GPH	960	720	576	480	411	360	320	288	262	240	221	206
					379 Litres	LPH	3632	2724	2179	1816	1557	1362	1211	1044	991	908	838	778
BTH 300	NATURAL/ PROPANE	300,000	88	96%	130 U.S. Gals.	GPH	1164	873	699	582	499	436	388	349	318	291	269	250
					492 Litres	LPH	4406	3304	2644	2203	1888	1652	1469	1322	1201	1102	1017	945
BTH 400	NATURAL/ PROPANE	399,900	117	96%	130 U.S. Gals.	GPH	1552	1164	931	776	665	582	517	465	423	388	359	332
					492 Litres	LPH	5875	4406	3525	2938	2518	2203	1958	1759	1602	1469	1356	1259
BTH 500	NATURAL/ PROPANE	499,900	146	95%	130 U.S. Gals.	GPH	1919	1439	1151	959	822	720	640	576	523	480	443	411
					492 Litres	LPH	7263	5447	4358	3631	3113	2724	2421	2179	1981	1816	1676	1556

Recovery capacities are based on heater performance at 95% and 96% thermal efficiency.

Add "A" to model number when ordering ASME. Optional on 120 - 250 models. Standard on 300 - 500 models.

Maximum gas supply pressure for 120 - 250: 10.5" w.c. natural gas 14" w.c propane. Maximum gas supply pressure for 300-500 10" w.c. natural gas 13" w.c. propane.

Manifold pressure: 4" w.c. natural gas 10" w.c. propane. Electrical requirements: 120 VAC, Blower 2.2 Amps FL, Igniter 4.0 Amps.

SUGGESTED SPECIFICATION

(Natural or Propane) gas water heater(s) shall be A. O. Smith Cyclone Xi model # _____ or equal, with up to 96% thermal efficiency, a storage capacity of _____ gallons, an input rating of _____ BTUs per hour, a recovery rating of _____ gallons per hour (gph) at 100° F rise and a maximum hydrostatic working pressure of 160 PSI. Water heater(s) shall: 1. Have seamless glass-lined steel tank construction, with glass lining applied to all water-side surfaces after the tank has been assembled and welded; 2. Have a spiral-shaped heat exchanger placed entirely inside the tank, which shall be glass-lined to protect against acidic flue gas condensate; 3. Have foam insulation and an ASME-rated temperature and pressure relief valve; 4. Have a down-fired power burner designed for precise mixing of air and gas for optimum efficiency, requiring no special calibration on start-up; 5. Be approved for 0″ clearance to combustibles.

Heater shall be supplied with maintenance-free powered anode.

The control shall be an integrated solid-state temperature and ignition control device with integral diagnostics, graphic user interface, fault history display, and shall have digital temperature readout.

The water heater(s) shall: 1. Be design-certified by UL (Underwriters Laboratories), according to ANSZ21.10 standards governing storage-type water heaters; 2. Meet ASHRAE/IESNA 90.1-1999; 3. Be design-certified by Underwriters Laboratories for 180° F (62° C) water; 4. Meet SCAQMD Rule 1146.2 for low-NOx emissions.

For conventional-vent specification: The BTH-120 - 250 water heater(s) shall be suitable for venting in 3″ PVC pipe for a total equivalent distance of 50 ft and 4″ PVC pipe for a total equivalent distance of 120 ft.

The BTH-300 - 500 water heater(s) shall be suitable for venting only in 4″ PVC pipe, for a total equivalent distance of 70 ft.

For sealed-combustion direct-vent specification: The BTH-120 - 250 water heater(s) shall be suitable for venting with (3″ or 4″) _____ diameter PVC pipe for a total equivalent distance of (50 ft or 120 ft) _____ feet. [Alternative venting: the heater(s) shall be suitable for sealed combustion direct venting using a (3″ or 4″) _____ diameter PVC exhaust pipe for a total distance of (50 ft or 120 ft) _____ equivalent feet of vent and (50 ft or 120 ft) _____ equivalent feet of intake.]

The BTH-300 - 500 water heater(s) shall be suitable for sealed combustion direct-vent using only 4″ diameter PVC pipe and 4″ diameter PVC exhaust pipe for a total equivalent distance of 70 ft.

Operation of the water heater(s) in a closed system where thermal expansion has not been compensated for (with a properly sized thermal expansion tank) will void the warranty.

For Technical Information and Automated Fax Service, call 800-527-1953.

A. O. Smith reserves the right to make product changes or improvements without prior notice.

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